Annotations

Liver transplantation—a role for all paediatricians

In the last three years there has been an encouraging improvement in the success rate and availability of liver transplantation for children. One year survival figures of between 50 and 90% are being reported from an increasing number of centres in Europe and the United States. If all paediatricians were concerned about the plight of children with liver disorders the position would be much better.

The current problems were assessed at a symposium on medical, surgical, and paramedical aspects of liver transplantation in children in Louvain, Belgium, in October 1986.¹ Four years ago only the Pittsburgh Service under the direction of Professor Tom Starzl had appreciable experience of liver transplantation in children.^{2,3} At the Louvain meeting results were reported from seven other services in which between 23 and 44 children had had liver grafts. Altogether, 68% of 243 children were alive at the time of reporting, three months to three years after grafting. The age at grafting ranged from 14 days upwards.

The experience of the Cambridge/King's College Hospital Paediatric Liver Transplantation service, an extension of the adult programme directed by Professor Sir Roy Calne and Dr Roger Williams,^{3,4} was similar to that reported from other centres and illustrates current short term results.⁵ Eighty four children were assessed for liver transplantation. Eighteen, mainly infants with extrahepatic biliary atresia were not accepted because of features that made successful transplantation unlikely. Five had irreversible disease in other systems, seven had blocked portal veins, and nine weighed less than 10 kg, a size at which technical difficulties may be anticipated but also at which donor livers of suitable size are rarely available. Four children were withdrawn from the programme by their parents. Nine died before a donor of suitable size or compatible blood group could be found. Nine were awaiting transplantation and nine had been accepted for liver transplantation but were sufficiently well at the time for this to be postponed.

Thirty five have had liver grafts. Of these, 17 had biliary atresia, eight had cirrhosis after hepatitis in infancy, five had fulminant or subacute hepatic failure, three had liver tumours, and two had metabolic disease. Fourteen died, nine in the first

two months mainly from primary graft failure or vascular thrombosis, later deaths being due to rejection, infection, or dissemination of malignant disease. Two, with a normally functioning transplanted liver, died of disease in other organs. Three of the survivors have had a second liver transplant. Most are engaged in normal activities for their age, growing and developing satisfactorily with complete regression of features of cirrhosis. Three do have considerable hepatobiliary problems, which may require retransplantation.

The condition of 65 children from a group of 90 children transplanted in Pittsburgh between 1981 and 1984 was particularly encouraging.⁶ All had been followed up for more than two years. Most were leading normal lives for their ages, 77% were attending school in a normal fashion, and 75% were showing normal or accelerated growth rates, although 40% did have slightly abnormal aspartate aminotransferase activities up to 2.5 times the upper limit of normal. An equal number had increased blood urea concentrations, a side effect of treatment with cyclosporin.

Professor Starzl, analysing some aspects of his experience of over 600 liver transplants, 240 of which had been performed in children (365 were performed in 1985), emphasised that there are still major technical and biological problems to be overcome if the one year graft survival rate of 54% and the five year graft survival rate of 45% were to be improved.⁷ Only the Pittsburgh service has sufficient donors available to offer retransplantation to an appreciable percentage of patients in whom the first graft fails. Such patients are given priority when a donor liver becomes available: hence the 90% one year survival rate in Pittsburgh. Lack of donors is a particular problem below 1 year, the age at which most potential recipients die. Professor Otte's group has shown that using part of the liver of an older child⁸ is a feasible alternative.⁹

An important contribution to the welfare of children with chronic liver disease has been the development of parents associations—for example, the Michael McGouch Foundation against Liver Disease in Children—usually started by individual parents driven by the plight of a child dying of liver disease. These associations provide invaluable emo-

tional and social support for parents, as well as striving to improve services. To obtain the services the children require these parents have often had to add to their problems¹⁰ by obtaining 'media exposure'.

What can all paediatricians do to improve the situation? When faced with the hopeless situation of a brain dead child on a ventilator, remember that another child will be facing death from advanced kidney, heart, or liver disease. The only hope for that child and the family will be a grafted organ. The only comfort for the parents of the dying child on a ventilator may be in helping other parents who without a donor would also lose a child. Currently, the longest survival with a good quality of life after liver transplantation is 17 years.⁷

The second task is less dramatic: making transplantation unnecessary for most infants with biliary atresia by offering expert surgery by 8 weeks of age. This has been achieved in Japan. Altogether, 90% of those operated on by 60 days of age are free of jaundice. The 10 year survival of those free of jaundice is 90%.¹¹ This would require paediatricians to see all infants who are jaundiced after 14 days of age and to investigate those who have jaundice associated with yellow (bile containing) urine for hepatobiliary disease (an incidence of about one in 500). Only one in 12–14 000 would have biliary atresia,¹² but the remainder would have disorders that are best managed if identified early. Infants should be seen for 'well baby' review not at 6 weeks of age but at 4 weeks as occurs in Japan.^{13 14}

In this way, mild jaundice that had not caused concern to parents or primary health care advisers would come to the attention of doctors sufficiently early for biliary atresia to be identified by 8 weeks. The good results in Japan arise not because the cause of the disease is different there or solely because of earlier identification but also because cases are concentrated in units that have developed the necessary expertise.^{13 14} In Britain only a minority of infants with biliary atresia are so privileged.¹⁵

I suspect that the Japanese are no better at making cars than other nations but are more organised.

References

- ¹ Symposium on liver transplantation. *Liver transplantation in children. Medical, surgical and paramedical aspects*. Proceedings of a European symposium on liver transplantation. Louvain, October 1986. In: Rapaport FT, ed. *Transplantation proceedings*. New York: Health Sciences Center, 1987. (In press.)
- ² Starzl TE, Iwatsuki S, Van Theil DH, et al. Evolution of liver transplantation. *Hepatology*, 1982;2:614–32.
- ³ Calne RY, ed. *Liver transplantation: the Cambridge/King's College Hospital experience*. 2nd ed. London and New York: Grune and Stratton, 1987.
- ⁴ Jackson ADM. Liver transplantation. *Arch Dis Child* 1986;61:1250.
- ⁵ Pett S, Pelham A, Tizard J, et al. Paediatric liver transplantation. Cambridge/King's series, December 1983–August 1986. In: Rapaport FT, ed. *Transplantation proceedings*. New York: Health Sciences Center, 1987. (In press.)
- ⁶ Zitelli BJ, Gartner JC, Malatack JJ. Long-term functional results and rehabilitation: the viewpoint of the paediatrician. In: Rapaport FT, ed. *Transplantation proceedings*. New York: Health Sciences Center, 1987. (In press.)
- ⁷ Starzl TE. Twenty years of paediatric liver transplantation: present achievements and issues for the future. In: Rapaport FT, ed. *Transplantation proceedings*. New York: Health Sciences Center, 1987. (In press.)
- ⁸ Bismuth H, Houssin D. Transplantation hépatique chez l'enfant. Facilitation par l'usage d'un foie adulte réduit pas hepatectomie. *Chirurgie* 1985;111:124–31.
- ⁹ Otte JB, Ville de Goyet J, De Hampton B, et al. The University of Louvain experience. In: Rapaport FT, ed. *Transplantation proceedings*. New York: Health Sciences Center, 1987. (In press.)
- ¹⁰ Gold LM, Kirkpatrick MSW, Fricker FJ, Zitelli BJ. Psychosocial issues in pediatric organ transplantation: the parent's perspective. *Pediatrics* 1986;77:738–44.
- ¹¹ Ohi R, Hanamatsu M, Mochizuki I, Chiba T, Kasai M. Progress in the treatment of biliary atresia. *World J Surg* 1985;9:285–93.
- ¹² Dick MC, Mowat AP. Hepatitis syndrome in infancy. An epidemiological survey with 10 year follow up. *Arch Dis Child* 1985;60:512–6.
- ¹³ Anonymous. Biliary atresia: lessons from Japanese experience (Editorial). *Lancet* 1980;ii:1283–4.
- ¹⁴ Hayes DM, Kimura K. *Biliary atresia. The Japanese experience*. Cambridge, Massachusetts: Harvard University Press, 1980.
- ¹⁵ McClement JW, Howard ER, Mowat AP. Results of surgical treatment for extrahepatic biliary atresia in the United Kingdom, 1980–82. *Br Med J* 1985;295:345–7.

A P MOWAT
Department of Child Health,
King's College School of Medicine and Dentistry of
King's College London,
Denmark Hill,
London SE5 8RX